

-----Original Message-----

From: patnews@ns1.patenting-art.com

Sent: Monday, July 31, 2006 12:33 AM

To: AB98 Comments

Subject: Submitted comments for RFC re Interim Guidelines

TO: PTO OFFICE OF PATENT EXAMINATION POLICY

FROM: Gregory Aharonian

RE: Request for Comments on Interim Guidelines for Examination of Patent  
Applications for Patent Subject Matter Eligibility

DATE: 31 July 2006

Dear Sirs,

In regards to your 12 June 2006 Federal Register announcement extending the time period to 31 July 2006 for submitting comments on this issue, I am submitting the following materials.

These materials review the current scientific view of information (and thus data) as a physical quantity, making transformations of information and data to be physical transformations achieved by information technology devices. These materials were first published in past issues of my free patent newsletter, the Internet Patent News Service.

Additionally, I have previously mailed your office two copies of a book on the current physics view of information as physical. This book has a nice read to, and is meant to supplement the arguments in the following materials.

If you have any questions, please contact me.

Greg Aharonian  
Editor, Internet Patent News Service  
San Francisco, CA  
31 July 2006

=====  
=====

DATE: 20060306

TITLE: Do PTO policy people understand language and semantics?

TEXT:

Last fall, the PTO released Interim Guidelines for Examination, in response to the Lundgren decision. On November 11th, my PATNEWS criticized the many semantic problems with these guidelines - circularly defined terms (such as "tangible" and "functional"), science terms used incorrectly ("energy", "physical"), etc. My critique at: [www.bustpatents.com/sec101/guideprb.htm](http://www.bustpatents.com/sec101/guideprb.htm)

On Dec. 20th, the PTO issued a Request for Comments on language problems in the Guidelines ([www.uspto.gov/web/offices/com/sol/notices/70fr75451.pdf](http://www.uspto.gov/web/offices/com/sol/notices/70fr75451.pdf)). I would like to think my PATNEWS had some role in getting the PTO to issue this RFC, since I was one of the few people critiquing its problems. NOT. Alas, some of the questions in their RFC are as flawed as the flaws in their guidelines, especially Question 1. They just aren't listening.

Question 1 in the RFC tries to address the philosophy of software patents:

"Is the distinction between physical transformation and data transformation appropriate in the context of the Patent Subject Matter Eligibility Interim Guidelines?"

Whichever lawyers at the Patent Office policy office wrote this question have little knowledge of modern physics. I criticize this type of language in PATNEWS because it is flawed both semantically and scientifically, and no one paid any attention. The PTO Policy Office has to respect the science that they are supposed to be helping to progress.

Lets's look at some of the problems with this question. First, it assumes an answer:

"Is the distinction between physical transformation and data transformation ..."

As I have argued in many PATNEWS (and this one below), depending on how you define "physical" and "data", THERE IS NO DISTINCTION. Does the PTO define these terms in the RFC? NO. The question is poorly worded. So the question should be changed at least to:

"Is there a distinction between physical transformation and data transformation ..."

Even worse, the question is scientifically ignorant because nowhere in

the question, or the RFC, does the PTO use the term for a set of data (what is practically being transformed in patents - think of sorting a list) - "information". Leaving out "information" is bad science, making the question pointless.

To understand this, let's turn to a resource unavailable to PTO policy people - a good dictionary. Let's use the court approved, comprehensive Webster's Encyclopedic Unabridged Dictionary, and start with "data":

- data - a) individual facts, statistics, or items of information
- b) a body of facts, information
- c) plural of 'datum'
- datum - a) a single piece of information

This definition reflects the general science view of "information" defined as a "set of data". For the PTO Policy Office to use "data" and "physical" and not mention "information" is to play games with language and science. Given that new inventions don't transform a "datum" but rather a set of data (i.e., sorting a list, discrete signal transform), the PTO's original question:

"Is the distinction between physical transformation and data transformation ..."

should be changed to:

"Is there a distinction between physical transformation and sets of data transformation ..."

which in light of dictionary and physics conventions gets us to:

"Is there a distinction between physical transformation and information transformation ..."

That's the question the PTO should have asked, but didn't, rendering this question in the RFC pointless. And even if they had asked, they probably are wasting their time. As one of the physics articles below states:

"This implies that the distinction between information, that is knowledge, and reality [i.e., the physical] is devoid of any meaning."

This meaningless is further seen in industrial data. A recent study by Federal Reserve economists, "Intangible Capital and Economic Growth"

(papers.nber.org/tmp/16760-w19948.pdf), reports that by the late 1990s, the United States was making about \$1 trillion in intangible asset (informational) investments, and about \$1 trillion in traditional fixed (physical) investments. Informational and physical - equally important and increasingly inseparable.

Let's turn to the definition of "physical" to understand this better:

physical - of or pertaining to that which is material

Here we encounter a semantic problem: "material" is defined as "a substance a thing is made of", leading to

physical - of or pertaining to that which is a substance

which creates a problem since "substance" is defined as "physical material", leading to the circular definition:

physical - of or pertaining to that which is a physical material

But this circularity doesn't necessarily frustrate our patent law analysis. If the definition was just:

physical - of                      that which is a physical material

then one could argue that information "isn't physical", isn't a physical material, and then the PTO could legitimately use the word "distinction" in its question. But in light of the other definition

physical -            pertaining to that which is a physical material

then as I show below from the latest physics theories, where information definitely pertains to the physical, if not IS physical itself, then the PTO can't use "distinction" because information/data is physical.

Now the PTO, being unable to formally define "physical" because of these semantic problems, could empirically define "physical". For example, they could say "By physical, we mean properties of system such as mass, structure of elements, charge, spin, temperature, position, velocity, acceleration, etc.", since tremendous numbers of patents are based on transforming the mass, charge, spin, temperature, etc. of systems.

The problem for the PTO's question is that some of these characteristics, such as temperature, "pertain" to physical material. One definition of

temperature is (change in heat / change in state function) for a system, which "pertains" to the associated physical material because the state function is not a material.

So we can legitimately propose the following:

If information pertains to materials, then information is physical and there is no distinction between physical transformation and information transformation.

though the more stronger is preferred

If information is physical, then there is no distinction between physical transformation and information transformation.

and in both cases, there is also no distinction between physical and data transformation. So the question is, what does physics say about the physicality of information? This is the question that the PTO should have asked if it understood the scientific issues at the heart of this question. (And yes, so too should the European Patent Office be asking this question if it is going to keep on using the silly "technical effects", i.e., "applied science effects", criteria).

Let's start with a new book that has just been published: "Decoding the Universe: How the New Science of Information is Explaining Everything in the Cosmos, from Our Brains to Black Holes", by Charles Seife (Viking Press). The book addresses the issue so well that I will be buying copies and mailing them to the policy people at the PTO. Let me quote from just the introduction to his book (page 2):

"The laws of thermodynamics - the rules that govern the motion of atoms in a chunk of matter - are, underneath it all, laws about information. The theory of relativity, which describes how objects behave at extreme speeds and under the strong influence of gravity, is actually a theory of information. Quantum theory, which governs the realm of the very small, is a theory of information as well. The concept of information, which is far broader than the mere content of a hard drive, ties together all these theories into one incredibly potent idea."

How you ask?

"Information theory is so powerful because INFORMATION IS PHYSICAL. Information is not just an abstract concept, and it is not just facts or figures [i.e., data], dates or names. It is a concrete property of matter and energy that is quantifiable and measurable. It is every bit [greg note: actually, it is bits - see below] as real as the weight of a chunk of lead or the energy stored in an atomic warhead, and just like mass and energy, information is subject to a set of physical laws that dictate how it can behave - how information can be manipulated, transferred, duplicated, erased or destroyed. And everything in the universe must obey the laws of information, because everything in the universe is shaped by the information it contains."

"Information appears, quite literally, to shape our universe. The motion of information may well determine the physical structure of the cosmos. And information seems to be at the heart of the deepest paradoxes in science - the mysteries of relativity and quantum mechanics, the origin and fate of life in the universe, the nature of the ultimate destructive power of the black hole, and the hidden order in a seemingly random cosmos."

So when the lawyers in the PTO Policy Office write

"Is the distinction between physical transformation and data [i.e. information] transformation ..."

they have absolutely no idea what they are talking about. As a scientist, I completely resent the arrogance of lawyers to so cavalierly misuse science. If there is no scientist staff member in the PTO Policy Office, there desperately needs to be one - I am tired of the false science (e.g., the phrase "energy or matter" which is relativistic nonsense). The question offends the society of physicists ("offends" as in the CFR/MPEP rule against socially offensive language in patent documents :-).

Now the author of these quotes, Charles Seife, is a journalist with a degree in mathematics reporting on the work of scientists. Maybe he is getting it wrong, or wrongly glorifying information. To check, let's turn to these physicists and see what they say. A few years ago, a book was published in honor of John Archibald Wheeler, one of the great physicists of the 20th century (co-author of the classic "Gravitation" by Kip, Thorne, and Wheeler). One of the papers in the book was written by Anton Zeilinger, a physicist at the University of Vienna (hire him, EPO, now!!). His paper "Why the quantum? 'It' from 'bit'? A participatory

universe", concludes:

But still, one may be tempted to assume that whenever we ask questions of nature, of the world there outside, there is reality existing independently of what can be said about it. We will now claim that such a position is void of any meaning. It is obvious that any property or feature of reality "out there" can only be based on information we receive. There cannot be any statement whatsoever about the world or about reality that is not based on such information. It therefore follows that the concept of a reality without at least the ability in principle to make statements about it to obtain information about its features is devoid of any possibility of confirmation or proof.

This implies that the distinction between information, that is knowledge, and reality [i.e., the physical] is devoid of any meaning.

[Greg note: and yet the PTO's question assumes the distinction does have meaning. I defer to the physicists, not the PTO's lawyers]

Evidently what we are talking about is again a unification of very different concepts. The reader may recall that unification is one of the main themes of the development of modern science.

[Greg note: the development of modern science is the progress of modern science - progress fostered by the patent system. For the patent system to deny this unification of information and the physical is to oppose this progress of science, a betrayal of the Constitutional imperative for patents.]

... In other words, it is impossible to distinguish operationally [i.e., concretely, tangibly and usefully] in any way reality and information. Therefore, following Occam's razor, the notion of the two being distinct should be abandoned, as the assumption of existence of such a difference does not anything that could not also be obtained without it.

Therefore, if we now investigate fundamental elements of information, we automatically investigate fundamental elements of the world. We have already seen earlier that any representation of information is based on bits. ... In view of our proposal that information and reality are basically the same, it follows that reality also has

to be quantized. In other words, the quantization of physics is the same as the quantization of information.

So when the PTO, in its current Request for Comments, asks:

"Is the distinction between physical transformation and data transformation appropriate in the context of the Patent Subject Matter Eligibility Interim Guidelines?"

it is asking a question that makes a false science assumption that conflicts with the progress of science. The question should be retracted and the PTO issue a new Request for Comments.

A paper by another European, Adan Cabello (University of Sevilla) - someone else the EPO should retain as "technical effects" consultant - titled "Communication complexity as a principle of quantum mechanics" has the abstract:

"We introduce a two-party communication complexity problem in which the probability of success by using a particular strategy allows the parties to detect with certainty whether or not some forbidden communication has taken place. We show that the probability of success is bounded by nature; any conceivable method which gives a probability of success outside these bounds is impossible. Moreover, any conceivable method to solve the problem which gives a probability success within these bounds is possible in nature.

This example suggests that a suitably chosen set of communication complexity problems could be the basis of an information-theoretic axiomatization of quantum mechanics.

If information science axiomatizes quantum mechanics, information is more physical than physical, making "distinction" one word that should appear nowhere in these discussions. Save your unscientific dichotomies for copyright law.

There is much more from the writings of physicists to support what Seife, Zeilinger and Cabello write. But I am saving these additional writings for a lawsuit I pledge to file against the PTO under the APA if any future policy has the irrational assumption that data/information and the physical are distinct, or if any future policy has energy signals as non-physical because of their Einstein-insulting phrase "energy or matter". And I will win, because I have physics on my side, which always beats

cutting and pasting.

=====  
=====

DATE: 20060307  
TITLE: More physics abstracts on information as physical  
TEXT:

In yesterday's PATNEWS, I argued that one of the PTO's questions in its December Request for Comments:

Is the distinction between physical transformation and data transformation appropriate in the context of the Patent Subject Matter Eligibility Interim Guidelines?"

is both scientifically and semantically poorly written, and that it should be

Is there a distinction between physical transformation and information transformation appropriate in the context of the Patent Subject Matter Eligibility Interim Guidelines?

a question I then answered NO in light of modern physics because, at a minimum, information pertains to physical matter, if not IS physical matter (and vice versa). What follows are more physics journal abstracts on information as a basis for the physical. The PTO Policy Office has to start relying more on science when it asks scientific questions. And this 101 question is purely a question of science.

Given the Constitutional purpose of patents and copyrights to progress the sciences, the foundations of patent and copyright law must rest on these sciences. No longer can nonsense science be relied upon for these foundations, such as the fiction that information is not physical, or that a fixed/physical expression is not an article of manufacture.

=====

Quantum mechanics is about quantum information.  
Foundations of Physics, vol.35, no.4, April 2005, pp.541-60  
Abstract

I argue that quantum mechanics is fundamentally a theory about the





Environment as a witness: selective proliferation of information and emergence of objectivity in a quantum universe.

Physical Review A, vol.72, no.4, Oct. 2005, pp.42113-1-19.

Abstract

We study the role of the information deposited in the environment of an open quantum system in the course of the decoherence process. Redundant spreading of information - the fact that some observables of the system can be independently read off from many distinct fragments of the environment - is investigated as the key to effective objectivity, the essential ingredient of classical reality. This focus on the environment as a communication channel through which observers learn about physical systems underscores the importance of quantum Darwinism - selective proliferation of information about "the fittest states" chosen by the dynamics of decoherence at the expense of their superpositions - as redundancy imposes the existence of preferred observables. We demonstrate that the only observables that can leave multiple imprints in the environment are the familiar pointer observables singled out by environment-induced superselection (einselection) for their predictability. Many independent observers monitoring the environment will therefore agree on properties of the system as they can only learn about preferred observables. In this operational sense, the selective spreading of information leads to appearance of an objective classical reality from within the quantum substrate.

Local versus nonlocal information in quantum-information theory

Physical Review A, vol.71, no.6, June 2005, pp.62307-1-25

Abstract

In spite of many results in quantum information theory, the complex nature of compound systems is far from clear. In general the information is a mixture of local and nonlocal ("quantum") information. It is important from both pragmatic and theoretical points of view to know the relationships between the two components. To make this point more clear, we develop and investigate the quantum-information processing paradigm in which parties sharing a multipartite state distill local information. The amount of information which is lost because the parties must use a classical communication channel is the deficit. This scheme can be viewed as complementary to the notion of distilling entanglement. After reviewing the paradigm in detail, we show that the upper bound for the deficit is given by the relative entropy distance to so-called pseudoclassically correlated states; the lower bound is the relative entropy of entanglement. This implies, in particular, that any entangled state is informationally

nonlocal-i.e., has nonzero deficit. We also apply the paradigm to defining the thermodynamical cost of erasing entanglement. We show the cost is bounded from below by relative entropy of entanglement. We demonstrate the existence of several other nonlocal phenomena which can be found using the paradigm of local information. For example, we prove the existence of a form of nonlocality without entanglement and with distinguishability. We analyze the deficit for several classes of multipartite pure states and obtain that in contrast to the GHZ state, the Aharonov state is extremely nonlocal. We also show that there do not exist states for which the deficit is strictly equal to the whole informational content (bound local information). We discuss the relation of the paradigm with measures of classical correlations introduced earlier. It is also proved that in the one-way scenario, the deficit is additive for Bell diagonal states. We then discuss complementary features of information in distributed quantum systems. Finally we discuss the physical and theoretical meaning of the results and pose many open questions.

A critical comparison of three information-based approaches to physics.  
Foundations of Physics Letters, vol.13, no.1, Feb. 2000, pp.89-96

Abstract

Many of the laws of physics are expressions that define probability distributions. These laws may be derived through variation of appropriate Lagrangians. We compare and contrast three Lagrangian approaches which are based on information-theoretic considerations: the maximum entropy (ME) principle, the minimum Fisher information (MFI) approach and the principle of extreme physical information (EPI). (The latter also produces independent solutions by zeroing as well as varying the Lagrangian.) Though superficially similar, these three methods are markedly different in their world views and applicability to physics. Only the EPI principle applies broadly to all of physics, and we show that this is reasonable on the following grounds: Physics should not depend upon arbitrary subjective choices, but ME and MFI, both intrinsically Bayesian approaches, require the choice of arbitrary, subjectively defined inputs, such as prior probability laws and input constraints, for their implementation. EPI, in contrast, solves for its effective constraints, needs no prior distribution assumption and, hence, does not require any arbitrary subjective inputs.

Quantum information is physical.

Superlattices & Microstructures, vol.23, no.3-4, 1998, pp.419-32

Abstract

We discuss a few current developments in the use of quantum mechanically coherent systems for information processing. In each of these developments, Rolf Landauer has played a crucial role in nudging us, and other workers in the field, into asking the right questions, some of which we have been lucky enough to answer. A general overview of the key ideas of quantum error correction is given. We discuss how quantum entanglement is the key to protecting quantum states from decoherence in a manner which, in a theoretical sense, is as effective as the protection of digital data from bit noise. We also discuss five general criteria which must be satisfied to implement a quantum computer in the laboratory, and we illustrate the application of these criteria by discussing our ideas for creating a quantum computer out of the spin states of coupled quantum dots.

=====  
=====

DATE: 20051107  
TITLE: Critique of new PTO examination guidelines - some bad science  
TEXT:

On October 26th, Patent Commissioner John Doll released new patent examination guidelines for PTO examiners, mostly focusing on Section 101 concerns.

The guideline' message is that everything "practical/useful" is patentable under Section 101 (consistent with much quoted caselaw and modern science), except for a few things - the pure arts - that presumably still are not patentable (Annex IV). Sadly for examiners and applicants, the PTO's reasoning in Annex IV against patenting "pure art" is flawed on legal, semantic, and scientific grounds. Their science reasoning is so bad that they even manage to insult the world's most famous patent examiner, Albert Einstein.

After a short summary, the first part of my critique is a summary of the guidelines' restatement of just how broadly you can claim if your invention is "practical" and "useful". The second part critiques Annex IV, where the PTO tries to prohibit some types of patenting, prohibitions that ignore science and engineering. It is important that Commissioner Doll bring in some people who are so competent to fix the illogic of Annex IV. Otherwise, PTO management should stop wasting its time writing this stuff

since it makes us waste our time reading it.

## SUMMARY

First, a really short summary of most of the guidelines is that they make the following definitions and abandon the following tests or inventions:

### DEFINITIONS

patentable := practical applications and novel and unobvious

abstract := not practical

practical := concrete and tangible and useful

useful := specific and substantial and credible

tangible := practical or non-abstract

concrete := repeatable or reproducible or predictable

producibile := hand-made or machine-made

### ABANDONED TESTS

- "not in the technological arts"
- fails the Freeman-Walter-Abele test
- includes mental or human steps
- is machine implemented
- is a per-se data transformation

Add a ton of caselaw, and that's the bulk of guidelines, an uncontroversial restatement of accepted caselaw, though the above PTO definitions violate the PTO's own dictionary rule.

The guidelines problem, centered on Annex IV, involves the "pure arts", the "liberal arts", where inventors are currently pushing the patent system into. The first mistake involves the title:

ANNEX TITLE: "Computer-related nonstatutory subject matter"

BUT: "Computer-related" is a "technological arts" test

BUT: "Computer-related" is a "machine-implemented" test

AND SINCE: "technological arts" is a rejected test

AND SINCE: "machine-implemented" is a rejected test

ANNEX TITLE SHOULD BE:            Nonstatutory subject matter

#### ANNEX IV's NONSTATUTORY SUBJECT MATTER

- music
- literature
- art
- photographs
- arrangements of data

#### CIRCULAR PTO ILLOGIC FOR THE REJECTED INVENTIONS:

functional := has structural and functional interrelationships

Here's the problem for everyone: under PTO rules, a Perl script compiled into an .EXE file and stored on a computer-readable medium is patentable because the .EXE-file/medium is a computer component. So why isn't a MIDI script compiled into a .WAV file and stored on a computer-readable medium just as patentable when stored on a computer-readable medium? That is, why isn't music just as patentable as software? The PTO Board of Appeals asked this question over ten years ago (remember Beauregard?). For the PTO not to even consider this argument in these guidelines leaves the examiners with nothing to rely on when someone applies for a patent with this MIDI argument.

There is one difference between music and software, resolved with 1000 pages of mathematics and physics that provide structure and function. Cast that mathematics and physics into patent caselaw and music becomes patentable. With no recognition of the structure and function provided by such math and physics (not only for music, but other aspects of the arts), Annex IV is nonsense that should be immediately ignored.

This week a patent application for a movie plot was published: U.S. Patent Application 2005/0244804 titled "Process of relaying a story having a unique plot" - most likely the first of many, a flood precursor. After all, given Ex parte Lundgen (which is NOT going to be too modified by Metabolite), aren't there comparable probabilities between the State Street

patent being upheld and this plot patent being upheld? If so, doesn't that require law firms to start suggesting to their entertainment clients that they start considering applying for plot patents, especially if more Section 112-ish described plot patents start getting published?

The implicit argument is that movies are technological products. One proof? The 14 Nov. 2005 issue of Forbes, page 164, has the following table of the 20 highest-grossing movies, almost all of which depended on extensive visual effects - technological effects. Even if the "technological arts" test still held, how can the PTO argue that movies are not manufactured technological products, for some form of the arguments in this patent application (or better arguments if needed) to not satisfy Section 101?

TITLE	U.S. Box Office
Titanic (1997)	600,779,824
Star Wars (1977)	460,935,665
Shrek 2 (2004)	436,471,036
E.T. (1982)	434,949,459
Star Wars: Episode I (1999)	431,065,444
Spiderman (2002)	403,706,375
Star Wars: Episode III (2005)	380,262,555
Lord of the Rings III (2003)	377,019,252
Spiderman II (2004)	373,377,893
Christian violence-porn (2004)	370,270,943
Jurassic Park (1993)	356,784,000
Lord of the Rings II (2002)	340,478,898
Finding Nemo (2003)	339,714,367
Forrest Gump (1994)	329,691,196
The Lion King (1994)	328,423,001
Harry Potter (2001)	317,557,891
Lord of the Rings I (2001)	313,837,577
Star Wars: Episode II (2002)	310,675,583
Star Wars: Episode VI (1983)	309,125,409
Independence Day (1996)	306,124,059

What's patentable? What's not patentable? Are there any lines left? Is all expression now patentable? Fun times. But these guidelines? Useless. And no matter how much the PTO/ABA/AIPLA/IPO ignores the issue, it isn't going away - they can't resist the progress of sciences they supposedly are helping to progress.

## DETAILED CRITIQUE OF THE NEW INTERIM GUIDELINES

### WHAT IS BROADLY PATENTABLE

The guidelines emphasize that, except for a few things, anything that is "useful" and "practical" is patentable, the emphasis being on "useful". So the guidelines for many pages recite caselaw to emphasize this utility aspect of an invention. As well it should.

The problem is that the PTO's view of utility doesn't correspond exactly to the applicant's. Inventors view utility as a measure of how much they can sell their invention's products, market demand, even for the patent itself - the economic value of their invention is a measure of its utility to the inventor and the public. The PTO guidelines are pretty much silent on economics, despite the fact that the only reason any of us are playing this game is for the money. Some quotes from the guidelines:

Page 4 - "... the claimed invention is useful ..." - one of the repeated messages through the guidelines is that the patent be "useful", one of three aspects of "concrete, tangible and useful" from State Street.

The question is what is useful? Is making money useful (business methods)? Is inducing pleasure (a song) useful? There has always been a bit of the Puritan "work hard" in the mechanical sense aspect to patent utility, which in the information/service age is increasingly archaic. The PTO, latter in the guidelines, tries to define "useful", but not clearly, which I discuss below. But what is "useful" in the modern era needs to be reexamined for patent purposes.

Page 11 - "As the Supreme Court held, Congress chose the expansive language of 35 USC 101 so as to include 'anything under the sun that is made by man'" - Chakrabarty.

I agree, but only because this statement has massive loopholes. Presumably, Congress meant 'anything scientific or engineering under the sun made by man' but didn't so say because it was assumed by them that only science and engineering things are patented (assuming Congress even thinks when it votes about fundamental IP issues). The problem is that even today, Congress is mostly unaware of what modern science and engineering is - so when they use such language, they open the doors to whatever are the latest science and engineering developments, even if those developments are in

the "liberal arts".

Page 13 - "Second 35 USC 101 requires that the subject matter sought to be patented be a "useful" invention."

Again, the emphasis on useful, suggesting that you sprinkle "useful" throughout your application.

Page 13 - "These three exclusions recognize that subject matter is not a practical application or use of an idea, ..."

- a bit of a twist on utility, now it also has to be practical, though the guidelines don't say much on what is practical - so just sprinkle a few "practical" in your app.

Page 15 - quoting State Street, "..... in particular, its practical utility".

We get the point - practical and useful. A legitimate argument is that if someone wants to buy your patented product, or buy the patent itself, that alone is grounds that your patent is practical and useful, because someone else sees monetary value in your patent. The PTO tends to ignore the economic utility of patents, and this is wrong.

Page 19 - lines 5 and 10 - "practical application"

- finally the PTO gets around to defining this term in two ways, the latter being that the invention has to produce a "useful, concrete and tangible result", a test it repeats on page 20 - "the final result achieved ... useful, tangible and concrete". Page 20 and 21 the PTO so define these 101 tests as follows:

useful := specific and substantial and credible  
tangible := practical or non-abstract  
concrete := repeatable or reproducible or predictable

with the three definitions implicit in the rest of the guidelines, flowing from State Street:

patentable := practical applications and novel and unobvious  
practical := concrete and tangible and useful  
abstract := not practical

and one definition from page 56:

producible := hand-made or machine-made

The problem is that the first three definitions are semantically and legally confusing, which opens loopholes for applicants to exploit - good for applicants, but makes the examiner's job more difficult.

For example, the PTO views "tangible" as "non-abstract", even though the standard dictionary definition (which the PTO encourages applicants to use for most claim terms to make searching easier), the standard dictionary definition of "concrete" is "non-abstract". This is very sloppy.

The definition of "useful" - "specific and substantial and credible" is semantically inadequate. First, "specific" is more akin to "concrete", and if "specific" has to be used, include it under "concrete". "credible" is more along the lines of "repeatable", etc. seen under "concrete". "Substantial" - in what sense? An odd word indeed.

Also, there is no recognition of economics and money in this definition of "useful", and the last time I looked, that was one of the main reasons for the patent system - for people to invent things that they can sell for money to other people because the other people see enough use in the invention to spend their money. So I would replace "substantial" with "value" to give 101 more of an economic sense.

The PTO's definition for 101's "concrete" are terms more often (and appropriately seen) in the context of section 112 for enablement purposes. For example, on page 25 under section 112 concerns, the guidelines state that the invention has to be defined with a "reasonable degree of precision and particularity", which can be assured if using the definition leads to "repeatable or reproducible or predictable" results. On page 27 under 112, the guidelines similarly state "... without undue experimentation ..." for "a person of skill" (open heart surgery is not under for heart surgeons).

The PTO's definition of "concrete" is much more an enablement test, aggravating the confusion in many examiners' minds about where to draw the line between 101 and 112 (and I for one think 101 should be scrapped and subsumed entirely within 112 - 101 causes too many philosophical problems the patent system never has liked dealing with).

So these new PTO guidelines do little to clarify the philosophical aspects of Section 101 (and the PTO REALLLY REALLLY needs to get some people with experience in semantic analysis working at the PTO, both in the policy

offices and as examiners). The problem is the semantics of "abstract" - something the courts have never fully explained (using just as a mantra), and the PTO unable to explain. It is obvious that the PTO is struggling to find words to clarify the messages of caselaw with regards to Section 101.

For example, on page, it is written - "Of importance is the significance of the data ..." - whoever at the PTO wrote this is naively trivializing an area of semantic analysis long ignored by the IP world. As I said, it is time to eliminate 101 and incorporate it into 112.

Finally, page 42, Annex III will be useful for applicants - patent examiners CANNOT use the following excuses for a 101 rejection:

- "not in the technological arts"
- fails the Freeman-Walter-Abele test
- includes mental or human steps
- is machine implemented
- is a per-se data transformation

The funny thing is if you understand all of modern science, eliminating these tests pretty much makes anything in any form patentable. More below.

#### WHAT ISN'T PATENTABLE AND HOW THE GUIDELINES ARE GET IT WRONG

The rest of the guidelines, especially Annex IV starting at page 50, focus on what you can't patent. Here's the short form:

#### YOU CAN'T PATENT PURE WORKS OF ART OR SOCIAL METHODS

That is, Jay Thomas' deadly spectre of all liberal arts being patented is still a no-no, for which examiners can still issue mindless, unjustified 101 rejections. The problem is that the reasons the guidelines use to allow such rejections ignores too much science, and will be certainly challenged in Office Actions and appeals in the years to come.

#### AN ASIDE: YOU CAN'T PATENT A COMPLETE IDEA

A few times the guidelines state this rule from *Gottschalk v. Benson*. As an aside, I hold in contempt anyone who cites *Benson* who also doesn't cite Prof. Chisum's excellent law review article a few years after *Benson*

in which Chisum severely criticizes the many logical mistakes in Benson - "the reasoning in Benson is monstrously bad" (from "The Patentability of Algorithms", Univ. of Pittsburgh Law Review, 1986).

On page 14, we have "Accordingly, one may not patent every 'substantial practical application' of an idea .... because such a patent 'in practical effect be a patent on [idea ..] itself'. Gottschalk". This is repeated on page 23 "One may not patent a process that comprises every 'substantial practical application' of an abstract idea, because such a patent 'in practical effect would be a patent on the [abstract idea] itself".

So say I have an abstract idea with 26 practical embodiments, labelled "A" to "Z". The guidelines are pretty much saying that I can't have a 26 member Markush group or 26 dependent patent claims, so that I can claim all of the practical embodiments and therefore claim the abstract. Fine. I cut a deal with a friend of mine. I will patent 13 of the embodiments, A to M, and let him patent the other 13, N to Z. Neither of us can be hit with this Benson rejection, and I can sign a side deal that my friend gives me most of the profits he makes (keeping some for himself).

The Benson rule is cute, but easily circumventable, given a proper understanding OF the transactional costs of the patent system. Besides which, the PTO routinely issues such patents on abstract ideas, partly because there is no test for what is "all of the applications" (a test is silly as the merger doctrine's "only a few forms of expression").

#### ALL MATHEMATICAL ALGORITHMS ARE ABSTRACT

On page 17, we see "... claims directed to nothing more than abstract ideas (such as mathematical algorithms), ... are excluded from patent protection. Diehr".

Again, a naive and inaccurate view of mathematical algorithms. Not all mathematical algorithms are "abstract". Indeed, read the latest math, science and engineering journals, and you will see many new, specific mathematical algorithms being published that are definite not "abstract". To generally equate mathematical algorithms with abstract is bad science. And in light of MathCAD, Maple and Mathematica, it is much harder to say what is an unapplicable mathematical equation, when you can type all mathematical equations into these programs and instantly apply them.

## ANNEX IV: CAN'T PATENT THE LIBERAL ARTS

The remaining deficiencies of the guidelines deal with the patenting of the "liberal arts" - pure art and social methods. I say pure art because most forms of art are already being patented, both as articles of manufacture and as artistic processes (with the option of product by process claims). The guidelines, not completely clearly, seem to be focusing on the purest of the non-technical - music, literature, social methods (mostly business related such as bidding, buying, negotiating). And the PTO betrays the public for not mentioning which forms of art ARE already being patented.

The main guidelines mention this prohibition once, deferring to ANNEX IV. In the main section, page 16 we see as a prelude to Annex IV:

For example, a claim reciting only a musical composition, literary work, compilation of data, or legal document (e.g., an insurance policy) PER SE does NOT APPEAR to be a process, machine, manufacture, or composition of matter.

Why does it "not appear"? The guidelines at this point are silent, and rather sloppily don't point the reader to Annex IV where the guidelines try to answer this question. As is, it is a very provocative statement in the middle of the guidelines with no support. It should be removed, and replaced with a simple message to consult Annex IV.

### THE REAL ISSUE: ANNEX IV - "COMPUTER-RELATED NONSTATUTORY SUBJECT MATTER"

Pages 50 to 57 of the guidelines, Annex IV, is the real import of these guidelines. The rest of the guidelines is just a restatement of how caselaw supports all of what has been patented to date with regards to Section 101. That you have to wait 50 pages to get to the controversial stuff seems a bit of the old lawyerly "bury them with paperwork" so they get too bored to recognize the trick that appears later on.

First problem is the title of the section - "Computer-related nonstatutory subject matter". The PTO, especially in light of Lundgren, has conceded there is no technological-arts test, which presumably includes computers. So the more accurate title of this section should be "Nonstatutory subject matter" - "computer-related" is a technological arts test.

The Annex starts out with:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material".

with the following definitions:

FDMs := data structures, computer programs as a computer component  
NFDMs := music, literary works, compilation/arrangement of data

Whoever wrote this has no idea what they are talking about with regards to the arts and science. Counterexample: a MIDI file which is both a computer program, presumably a literary work (according to the view of the semantics-contemptuous copyright world), and music when compiled to a .WAV file, both an FDM and a NFDM. What the PTO is really saying is the following definitions:

FDMs := applied idea  
NFDMs := pure expression

That is, the PTO is trying to maintain the fiction that the utility patent (I said, UTILITY, not DESIGN) and copyright systems aren't already mostly overlapping. When the PTO and Copyright Office lied about this in the 1990s, no one was paying attention. They are now.

What is "pure descriptive material"? On page 50, citing Warmerdam and Lowry, the guidelines state:

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized.

Two big problems with this sentence. First, the latter part "use of technology" is a technological arts test the PTO just agree to reject. Do PTO policy makers pay attention to their own writings?

Second, what does the PTO mean by "computer readable"? I suspect it is a pre-1990s view of computing - magnetic/optical disks, magnetic tapes, punch cards, paper tapes (for all of you old DEC PDP fans), etc. - the traditional I/O medium for significant amounts of data (for example, on page 51 it refers to a "compact disk" [optical] and on page 57 it refers to a "format is a disk", presumably a floppy diskette [magnetic]). The phrase "computer-readable" also appears on pages 51 (lines 1, 5, 19), 52 (lines 13, 19), 53 (line 7), 54 (lines 1, 17), and 57 (line 8).

## HEY! TEXT ON PAPER IS A COMPUTER-READABLE MEDIUM

Here's the problem. Computer reading technology has vastly improved in the last 20 years. Optical character recognition software is accurate enough that a computer program printed on paper using a Courier or Times New Roman font is completely COMPUTER-READABLE to the extent that such a printed computer program can be scanned into a computer file in the same way a computer would read the program from a floppy disk and load it into a computer file. Same capability exists for sheet music - computers can scan in the printed note signs and turn them into music.

Any topologically simple 3 dimensional object surface is COMPUTER READABLE with the latest laser optical scanning and finite element analysis software (including the Statue of Liberty). Indeed, even the internal structure of 3d objects are COMPUTER-READABLE if the computer has as an input-device a NMR or CAT scan machine. There are thousands of patents on new computer-readable input devices that make almost any substrate - paper, ceramic, etc. - COMPUTER-READABLE. Human-readable and computer-readable are increasingly the same thing (which is why I didn't use "human-readable" in my definition of "source code").

For the PTO guidelines to repeatedly use this term COMPUTER-READABLE with no recognition of what that means in light of the latest science and technology is inexcusable. Again, good for the applicants because it opens doors for claiming, but bad for examiners because they will waste time with rejections that applicants can overcome because of the inadequacy of these guidelines. It is sloppy for the PTO to use the term many times without defining it.

Indeed for printed matter, the guidelines aggravate the confusion. On page 52 we see: "The USPTO may not disregard claim limitations comprised of printed matter. .... However, the examiner need not give patentable weight to printed matter absent a new and unobvious functional relationship between the printed matter and the substrate." How is the examiner to respond when the applicant argues "whatever new relationship there is between a new computer program and a known magnetic substrate is the same new relationship between a new computer program and a known paper substrate - both are computer-readable mediums."?

Bottom of page 52 - "In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships ... and thus is statutory". So why isn't a data structure printed on paper, which is a COMPUTER-READABLE medium,

just as statutory? Or an artistic data structure implicitly embedded in a painting, a data structure derivable from the painting by a computer, not just as statutory for being on a COMPUTER-READABLE medium?

The PTO has to stop ignoring what has become COMPUTER-READABLE, not just in the engineering literature, but also in its own issued patents. Page 54 - "When a computer program is recited in conjunction with a physical structure, such a computer memory, USPTO personal should treat the claim as a product claim." Again, the implication is that the physical structure is computer readable, like a computer memory. Not a pure computer-readable argument, but the same lack of precision. The guidelines use of "computer readable" is defective and should be corrected.

### CAN'T CLAIM PURE SIGNALS

Pages 55 and 56 deal with signals (a claiming trick used by lawyers):

The three product classes [machine,matter,manufacture] have traditionally required physical structure or material.

A claimed signal has no physical structure, does not itself perform any useful, concrete and tangible result, and, thus, does not fit within the definition of a machine.

A claimed signal is not matter, but a form of energy, and therefore is not a composition of matter.

Whoever wrote this last sentence should be repeatedly slapped in the face. And once he feels better, repeatedly slapped in the face again. I am sorry, but this is a completely stupid science statement.

Energy and matter not equivalent? Ever hear of ..... um ..... relativity? The guidelines use Einstein's formula,  $E=mc^2$ , as an example of a law of nature that can't be patented. Does the PTO realize that what this law of nature equates energy and matter? Matter is a form of energy, and energy a form of matter. Photons are both matter and energy, both waves and particles. Physicists use these words out of convenience. This last PTO statement is scientific nonsense. (And in some models of the physical universe, both energy and matter are defined in terms of information). For more, see "The Equivalence of Mass and Energy" at the Stanford Web site: <http://plato.stanford.edu/entries/equivME>.

Also nonsensical is the second sentence above - "A claimed signal has no physical structure" - signals are typically electromagnetic fields, which are physical structures. Signals now also can be quantum mechanical wavefunctions, which are also physical structures (indeed Hawking has a neat paper on a quantum mechanical wave function that describes the entire physical universe). This PTO statement is scientific nonsense. There are patents that are based on manipulating particle spin, which is one of the most unphysical physical concepts ever, since the particles don't spin but the use of "spin" makes a nice analogy. And just in case, naked-bottom quarks have no bodies or clothes.

I assume the PTO is trying to say something here. But whatever they are trying to say, they are abusing physics way too much. Examiners should not be allowed to use these particular guidelines until the PTO has this section reviewed by physicists.

#### THE PURE PATENTING PROBLEM - THE PURE ARTS

The real deep controversy of the guidelines (since everything above only creates billable-hour hurdles for applicants, not legal hurdles, since a good patent prosecutor will be able to argue around any of the above objections) is a few passages where the current conflict between patents and copyrights is the most hottest: the utility patenting of expression. As page 51 states: "Protection for this type of work is provided under the copyright law." (Fortunately for their credibility, the PTO didn't cite the totally irrelevant *Mazer v. Stein* which too many people forget dealt with DESIGN patents).

On page 50, we see the first recognition of this conflict:

"Nonfunctional descriptive material" includes but is not limited to music, literary works, and a compilation or mere arrangement of data.

from page 51:

Thus, nonstatutory music is not a computer component and it does not become statutory by merely recording it on a compact disk.

from page 52:

However, the examiner need not give patentable weight to printed

matter absent a new and unobvious functional relationship between the printed matter and the substrate.

from page 54:

Certain types of descriptive material, such as music, literature, art, photographs and mere arrangements or compilations of facts or data, without any functional interrelationship is not a process, machine, manufacture or composition of matter.

It is these four sentences that are the only non-trivial aspects of the new guidelines, and it is where the PTO is the most incompetent in terms of its knowledge of art, science and semantics, to write any guidelines.

First problem. The guidelines use very broad terms: "music", "art", etc., with no definitions to clarify. For example, are MIDI files and their compiled .WAV files music, as they can be isomorphic to sheet music? Are SVG files art? [MIDI is a musical annotation system, SVG is the Scalable Vector Graphics standard]. Everything in both the worlds of art and science are having multiple (XML) markup and annotation languages being developed. If the specifications for science and engineering allowing patent claiming, why not for the arts?

Second problem. "Functional relationships" - there is one word of science, at the heart of multiple patent applications (and a few issued patents) that instantly gives works of art functional and structural relationships, either implicitly or made explicit by "hand or machine". Since the guidelines are silent on the implicitness or explicitness of the functional relationships, it leaves the examiners ill-equipped when the applicants assert this word and its corresponding field of science.

Third problem. If you allow patents on artistic processes, for which there are thousands, and for which the guidelines state on page 54:

For example, a computer that recognizes a particular grouping of musical notes read from memory and recognizing that particular sequences, causes another defined series of notes to be played, defines a functional relationship among that data ... and as such is statutory .."

Well, if you allow artistic process patents of any sort, you then have to allow artistic product-by-process patents, since PbP patenting is well known across many fields. And if you allow artistic products, i.e., (non-functional expression) to be patented as a result of a

process, you pretty much have to allow the artistic product to be patented independent of the process (say as an article of manufacture). And this is already happening in most fields of art.

Which leaves where the real battles will be fought: words on paper (books), ink on a canvas/film (paintings, images), notes on a diskette (music) and the fusion of words, ink and notes - movies. All it seems to me that these guidelines are requiring is that if you want to patent any of these things, PER SE, describe it scientifically. And there is no one at the PTO qualified to address what that means, leaving the door wide open for smart applicants and their lawyer, using the latest science, to push the patent system to every these four articles of manufacture: books, music, imagery and movies.

Prediction: this controversy will be resolved only when patent applicants start filing such patents, the examiners reject them, the PTO board upholds the rejection (a comment in Beauregard indicates the PTO board has been waiting for this battle for over 10 years), and the science is argued out at the CAFC (the Supremes should really avoid deep IP policy until they apologize for the mess they created by Gottschalk). Though it would be just as nice if the PTO Board, given the necessary scientific information, would agree to this complete scope of patenting.

A few suggestions for the PTO. One, in light of the recently published patent application for a movie plot, as shocking now as the Compton's software patent was, the PTO should have some hearings on the patentability of art and entertainment. The patenting of art and entertainment is where the patenting of software was in the early 1990s. All it will take is more art patents being filed and a few favorable court decisions, and the PTO will be subject to a new flood. Might as well get ready now.

Two, with these strains on patenting, the division of patents into Mechanical, Chemical and Electrical is increasingly becoming archaic. Business methods without the technological arts test are really not electrical (even if they use computers). The PTO needs a fourth division: "Informational", "LiberalArtsy", etc. to have a home for patent examining groups and new patent classifications. This may not be traditional, but that's the excuse of people who want to stop science.

Three, PTO search resources for the arts, entertainment and business

methods are woefully inadequate, made worse by reliance on outsourcing. The PTO has to bulk up its internal PRINTED and electronic library resources - to empower the examiners. The atrium of the main PTO building in Alexandria should be jammed and crammed with bookshelves and books.

Fourth, the PTO needs to bring in outsiders to give lectures on the latest developments in science and engineering to the policy staff and PTO board of appeals. Both these guidelines, and the Lundgren decision, make multiple statements that are wrong in light of science and engineering developments. It wastes applicants time and money, and drags down the system, for applicants to have to overcome rejections and appeals by presenting to the PTO science and engineering information that the PTO should already be aware of and have incorporated into their policies. Given that much of the guidelines repeat the well known, and the rest is inadequately presented, these guidelines should be retracted. At best, they will have no effect, and at worst, cause applicants to waste money.